Gas Permeation Model of Low Density Polyethylene Packaging Films Filled with Ceramic Powders

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In MA(modified atmosphere) packaging to preserve freshness of vegetables and fruits for a long time, gas composition in packaging films is always an unsteady state. Before, the permeation process was expressed by the solution-diffusion mechanism at a steady state base. Present work has designed to investigate how to develop a new form of dissolution model, analyzed and compared the previous model with the new one at the equilibrium state. It is assumed dissolution rate was proportional to gas concentration of a bulk and vacant gas concentration at the film surface, with desorption rate being proportional to gas concentration at the film surface and being inverse-proportional to gas concentration of a bulk.

The simulation for the gas permeation model using above parameters calculated at an unsteady state was exactly predicted the process in which ethylene gas permeate through LDPE packaging films containing the ceramic powders.